

Missouri (George Reeder, section director).—Wheat is reported to be in good condition. Elberta peach buds, which had been forced by the warm weather, were impaired by the low temperatures of the 16th. The weather has been unusually favorable for outdoor occupations.

Mississippi (J. H. Scott, section director).—With the exception of 1910, this has been the driest March of record. The temperature was higher than usual.

ORIGIN AND PROGRESS OF LAND DRAINAGE IN BOLIVAR COUNTY, MISS.

By W. W. BOONE, Chief Engineer Bolivar County Drainage Commission.

In telling of the movement for land reclamation by drainage in Bolivar County, Miss., the writer deems it proper to give the reader at least a passing acquaintance with the previous history and character of the lands under discussion. Without going back farther than the advent of the white man into this territory, we will begin 50 years ago, when the Mississippi River was spreading her annual flood waters without human restrictions over the great and fertile Yazoo-Mississippi Valley, and each year adding to the vast store of natural wealth in the fabulous richness of her "delta" soil.

About 1858 the first organized effort in the State of Mississippi was made for protection from this yearly flood, when an act was passed by the State legislature creating the "general levee board." And then, down through all the successive stages of its development, the levee has grown, until to-day we have a system of levees along our river front the grade of which is 5 feet above the high-water grade line of the river.

Previous to the completion of the levees a majority of the planters in clearing their ridge land for cultivation had used the winding bayous or sloughs through their property as a dumping ground for the logs to be removed from the clearing. So that upon the completion of the levees the planters found that their natural drainage channels were totally inadequate to remove the heavy rainfall which floods all the lowlands during the spring and winter months. They then saw, too, that their natural drainage channels were fast filling up, or were already filled up, with tree tops, logs, and small debris, the aftermath of a great timber industry that had flourished in this section. The flood water of the Mississippi River had previous to the completion of the levees served to gather up and bear away on its tide this congestion of drift, brush, and debris, but since they had wisely chosen to exclude this natural flushing system from their domain, the planters were now confronted with the fact that they must turn to artificial means for the improvement of their drainage outlets. Still another and a greater reason for drainage, however, was the fact that with a rapidly increasing population, and a period of industrial prosperity being enjoyed throughout the entire country, the time was ripe and conditions demanded that the thousands of acres of rich swamp and timbered lands lying useless and a burden for the lack of drainage be reclaimed and turned into channels of usefulness.

The question of drainage was agitated by the people of the Yazoo-Mississippi Valley for several years, which movement crystallized into the passage of the "Alcorn drainage law" by the State legislature in 1906. Aside from this general drainage law, a number of special acts

creating drainage districts in different parts of the State were passed.

By the right expressed in this general drainage law the first step for organized drainage in Bolivar County was taken at a meeting of the leading citizens of the county at the county seat, Cleveland, in the spring of 1907, when petitions were put in circulation requesting the courts to organize a drainage district embracing specified lands in the east end of Bolivar County. The Bogue Hasty and Northern drainage districts were thus formed from lands lying for the most part between a large stream, the Bogue Phalia, on the west and the Yazoo & Mississippi Valley Railroad on the east. The total area of the two districts taken together was 146,000 acres.

Through the efforts of local landowners a party of engineers from the United States Department of Agriculture, Office of Experiment Stations, were sent on October 7, 1907, to make an investigation of the possibilities for drainage within the area proposed to be drained. These engineers spent four months in making preliminary surveys, and on October 3, 1908, submitted to the regularly appointed drainage commissioners of Bolivar County their plan of relief for the territory covered and the estimated cost of same.

The general plan recommended by the Government engineers was followed as to the location of the ditches, but it is a matter of much regret that their estimates as to the cost of completing the work fell far short of what the work is actually costing the drainage districts. To illustrate: Right-of-way clearing on the Bogue Phalia, which they estimated to cost \$300 per mile, is actually costing \$1,100, and right-of-way clearing on east Bogue Hasty, which they estimated to cost \$200 per mile, is actually costing \$375. This underestimation of the cost of completing the work in hand would have been a source of much confusion had not this mistake been detected by the drainage commissioners before they made their assessment.

The estimated cost submitted in the report of the engineers of the United States Department of Agriculture was increased 35 per cent by the board of drainage commissioners and their assessment made accordingly, the total assessment on the 146,000 acres being \$335,857.50. These figures give an average assessment of about \$2.30 an acre. The assessment roll was approved on the 18th of August, 1909.

Twenty-year bonds bearing 6 per cent interest were next issued in the sum of 80 per cent of the assessment. But before the bond sale could be made Hon. Thos. S. Owen, attorney for the drainage commissioners, framed a friendly suit and brought it before the supreme court of the State, this action being necessary before the approval of the bond attorneys could be had. The supreme court ruled in favor of the drainage district, after which the bonds were sold at their par value in April, 1910.

On April 18, 1910, the writer was employed as engineer for the drainage commission, the location of the canals was at once made, and on July 5 contract was let to R. H. & G. A. McWilliams, of Chicago, Ill., for the excavation of 1,155,000 cubic yards of earth at the conservative price of 9.65 cents per cubic yard. All of the contracts were subsequently let for the 85 miles of canal surveyed, at prices ranging from 10 to 15 cents per cubic yard of excavation. The total yardage for the entire work is 2,942,000 cubic yards, for ditches varying from 20 to 100 feet wide. There are now five dredge boats in the district, with two others to be erected within the next

60 days, and practically all the work will be completed by June, 1, 1912.

In reviewing some of the many benefits to be derived from the reclamation of swamp lands by drainage, attention is called to the fact that about 45 per cent of the land in the two districts is now in cultivation, and that the ditches are so designed as to relieve all of the land, thus making the other 55 per cent available for cultivation. It is an utter impossibility, however, to estimate all of the benefits to be derived from the construction of a system of drainage outlets in Bolivar County. In view of the fact that water is the arch enemy of good roads,

that good roads are an impossibility without drainage, we see that the improvements resulting to our public roads alone would warrant the expenditure of every dollar to be used in the construction of our ditches. Then, the improved health conditions resulting from drainage would warrant the expenditure of all the money to be used for drainage, and last, but not least, the certainty of a crop, the increased yield from well-drained land, and the increased land values resulting from drainage are but a few of the countless benefits which are sure to reward the efforts of the citizens of Bolivar County, Miss.